

Appl. No. 10/710,399  
Amdt. dated March 30, 2006  
Reply to Office action of January 06, 2006

### REMARKS/ARGUMENTS

Claims 9 and 10 are objected to for incorrect punctuation marks. Claims 1-12 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 6,736,306 to Byun et al..

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#### **1. Objection of claim 9 and 10:**

Claim 9 and 10 are objected for the following reason: the space(s) between the character(s) "C" and the end claim period "." should be deleted.

#### **10 Response:**

During electronic filling process, errors apparently occurred that altered the original office copy, altering the last sentence of claim 9 and claim 10 from "235°C." to "235°C \_.". Applicants appreciate the Examiner's suggested correction. The above-mentioned corrections are listed in the Listing of Claims section.

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#### **2. Rejection of claim 1:**

Claim 1 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Byun et al. Reasons of rejection are cited on page 3-4 of the above-mentioned Office Action.

#### **20 Response:**

Claim 1 of the present application is repeated below for reference:

25 "Claim 1: A semiconductor package which is positioned on a first substrate comprising:  
a second substrate having a first surface and a second surface;  
a chip positioned on the first surface of the second substrate;  
a plurality of first bonding balls positioned on the second surface of the second substrate  
and arranged in a line along a first direction for connecting the second substrate to the

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first substrate; and  
at least a dummy bonding bar positioned on the second surface of the second substrate for  
connecting the second substrate to the first substrate and preventing the  
semiconductor package from inclining to one side.”

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As shown in Fig. 4, the bonding balls of claim 1 are positioned on the second  
surface of the second substrate and arranged in a line. Those skilled in the art may notice  
that this arrangement may incline the second substrate to one side easily. Therefore, the  
dummy bonding bars are positioned along with the bonding balls to prevent the  
10 incline of the second substrate. Referring to Fig. 5 of Byun's patent, *the solder balls 160*  
*are formed on the ball pads 124 which are positioned in a rectangular array.* While the  
solder balls 160 are arranged in an array, the substrate of the semiconductor package will  
not have the inclining problem at all. In addition, the enhanced pads 170 comprise three  
components: one ball pad 124, at least one dummy pad 174 and dummy patterns 172, and  
15 *the enhanced pads 170 are arranged along the outer edges of the array.* The aim of the  
enhanced pads is to increase the joint force of the connection terminals 162 to prevent the  
occurrence of cracks of those solder balls. Therefore, Byun et al. do not teach the solder  
balls along with the dummy bonding bar arranged in a line, and the main intention  
of the dummy bonding bar of the present invention is to prevent the second  
20 substrate of the semiconductor package from inclining.

In addition, as the electronic devices in the chip are made progressively smaller,  
the size of the chip is generally shrinking. Compared to Byun's disclosure, the present  
invention discloses the bonding balls and the dummy bonding bars arranged in a line and  
provides smaller size and more delicate structure than Byun's disclosure for  
25 semiconductor chip packages. For these reasons, reconsideration of claim 1 is politely  
requested.

### 3. Rejection of claims 2-4:

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Claims 2-4 are rejected for reasons cited on page 4-5 of the above-mentioned Office Action.

**Response:**

The bonding bars of the present invention are formed in line on the second surface of the second substrate and the first direction is parallel to the long side of the second substrate. Please refer to Fig. 2, Byun et al. shows the ball pads 24 of the semiconductor package formed in a rectangular array on the bottom surface of the substrate 20. But, Byun et al. do not disclose the first direction being parallel to the long side of the second substrate. Moreover Byun et al. also do not disclose the long side of the dummy bonding bar being approximately perpendicular to the long side of the second surface. As claims 2-4 are dependent on claim 1, claims 2-4 should be allowed if claim 1 are allowed. Reconsideration of claims 2-4 is therefore politely requested.

**4. Rejection of claim 5:**

Claim 5 is rejected for reasons cited on page 5 of the above-mentioned Office Action.

**Response:**

Please refer to Fig. 6 and Fig. 10; the dummy bonding bar of the present invention has a planar third surface, and the connection between the dummy bonding bar and the first substrate is a surface contact. The planar third surface further prevents the second substrate of the semiconductor package from inclining to one side. However, in Fig. 4, 8c- 8d of Byun's patent, *the connection terminal 162 does not have a planar surface* and is formed by combining two solder balls resulting in a larger contact surface than the solder ball 160. The larger contact surface of the connection terminal 162 may prevent the cracks of those of the solder balls. Therefore, Byun et al. do not disclose the dummy bonding bar having a planar third surface to prevent the incline of the second substrate. In view of above, claim 5 should be allowable. Reconsideration of claim 5 is therefore politely requested.

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**5. Rejection of claims 6-12:**

Claims 6-12 are rejected for reasons cited on page 5-6 of the above-mentioned Office Action.

**Response:**

- 5 As claims 6-12 are dependent on claim 1, claims 6-12 should be allowed if claim 1 is allowed. Reconsideration of claims 6-12 is politely requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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- 15 Sincerely yours,



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- 25 Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)